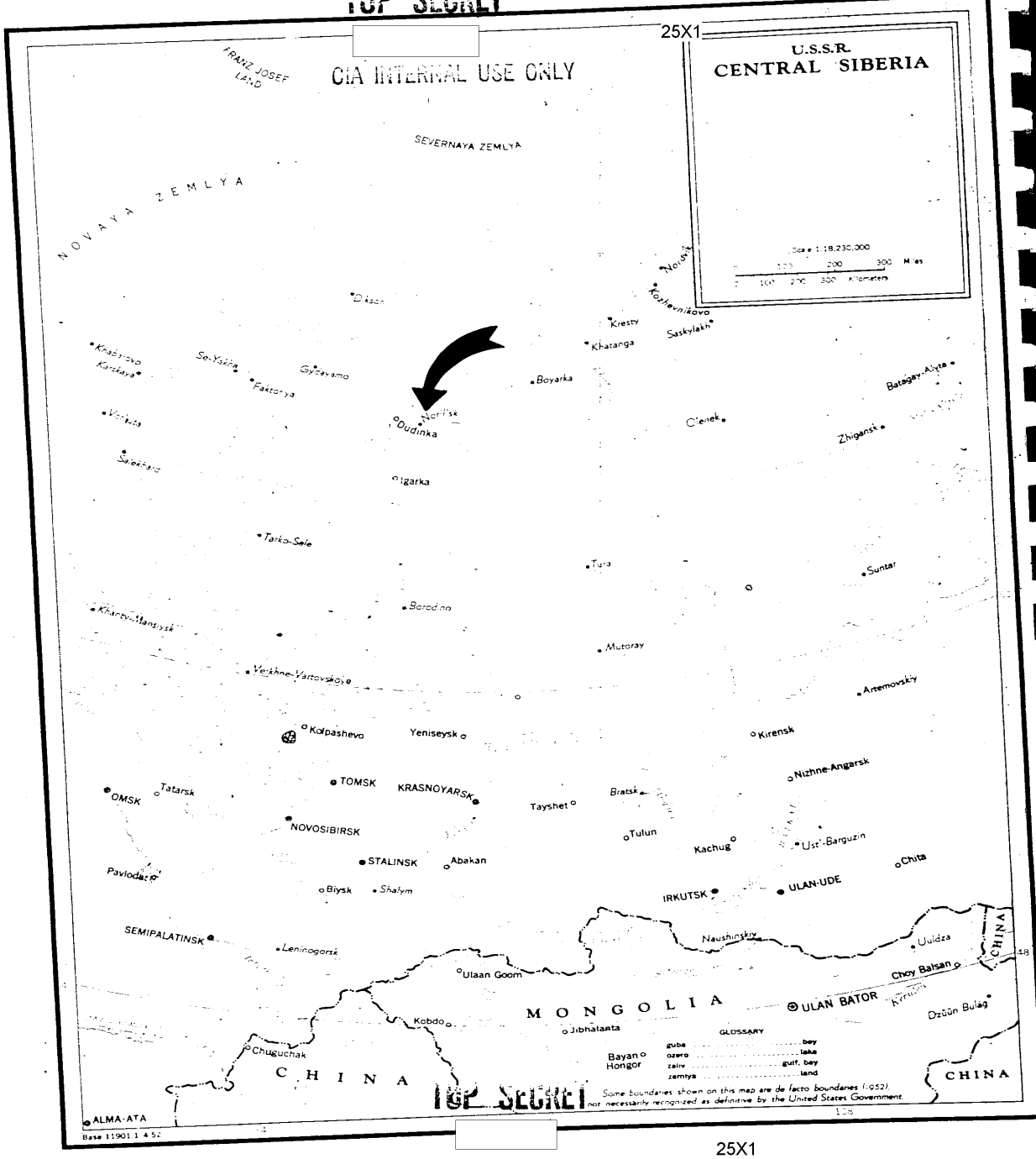
Approved For Release 2008/01/03 : CIA-RDP78T05439A000200240001-2

TOP SECRET

25X1



TOP SECRET

25X1

HTA/SM-1/57

MAJOR METALLURGICAL INDUSTRIES

NORILSK, USSR

Norilsk is located in a rich mining area of Northwestern Siberia at 69°20'N; 88°09'E some 200 miles north of the Artic Circle. It is connected by rail to Dudinka, an Artic sea route port on the Yenisey River fifty miles to the west, and by road to the village of Valek seven miles to the northeast. A mosaic of Norilsk (Plate 6) is enclosed showing the city layout with its industries and nearby associated mining areas.

The metallurgical industries, which are largely responsible for the development of Norilsk, are based on the exploitation of a complex copper-nickel ore body containing significant amounts of cobalt and precious metals. Twenty-five percent of Soviet nickel reserves are estimated to be contained in the Norilsk deposits, 1/ and it may be the largest Soviet source of cobalt.

HTA/SM-1/57

The major metallurgical industries described in this memorandum consist of the Ore Dressing Plant, the Nickel Smelter and Refinery, the Copper Smelter and Refinery and the Cobalt Smelter and Refinery. Components of each plant are annotated on the photographs, plate 1 through 5, and described in the accompanying keys.

The initial separation of the ore into a nickel ore concentrate and a copper ore concentrate is accomplished in the large flotation building of the Ore Dressing Plant (Plates 1 and 2). The nickel ore concentrate at this stage still contains a considerable amount of copper which is further separated out in the nickel smelting operation.

The Nickel Smelter and Refinery (Plate 3) is located one mile east of the Ore Dressing Plant, from which the nickel ore concentrate is transported by pipeline. The probable flow of materials through the smelter and refinery indicates use of the Orford Smelting process.

The Copper Smelter and Refinery (Plate 4) is located approximately four miles north of the open-pit mines and the Ore Dressing Plant. A pipeline (Plate 2) probably carries the copper ore concentrate from the Ore Dressing Plant to the Copper Smelter, since there is no direct rail connection between the two plants.

The Cobalt Smelter and Refinery (Plate 5) is located approximately two miles east of the Ore Dressing Plant and one mile east of the Nickel Smelter and Refinery. This plant differs from the others in that it is enclosed by a fence with guard towers.

Refined nickel, copper, cobalt, and associated precious metals are shipped by rail to a warehouse area near Kaerukan, approximately half-way along the railroad line between Norilsk and Dudinka, or directly to Dudinka. During the short ice-free summer period, the materials can then be shipped up the Yenisey River to Krasnoyarsk, approximately 1,000 miles south of Dudinka, or shipped by way of the Artic sea routes. Shipment by air can be made throughout the year.

HTA/SM-1/57

REQUIREMENT: Prepared in answer to RR/S/G/R1/56, RR/HTA/E/S6/57, and SI/S9/57 requesting a mosaic of the urban complex of Norilsk, USSR and a photographic analysis of the Nickel Combine and other metallurgical industries. The heavy water plant at Norilsk will be covered in a later report.

[redacted] 25X1

REFERENCES:

ATMP: 0048-9999-100A (Prov), 2nd Ed., Dec 1956
0048-9999-2-25A (Prov), 1st Ed., Dec 1956
0048-9999-TIS, Nov 1956

Other: 1. CIA. CIA/RR-PR-57, Nickel Supply in the Soviet Bloc, 28 Apr 1954. S.

HTA/SM-1/57

2. Army. Army Headquarters [redacted] 25X6
Report No. 35, 26 Jun 1954. [redacted] 25X1

3. Army. [redacted] 15 May 1957. 25X6
[redacted] 25X1

4. Air. DPIR, Target Complex Analysis (FF) No. 23, Nov 1956. [redacted] 25X1

25X1

TOP SECRET

HTA/51-1/57

25X1

TOP SECRET

Plate 1

25X1

TOP SECRET [redacted] 25X1

CIA INTERNAL USE ONLY

HTA/SM-1/57

KEY TO ANNOTATIONS
ORE DRESSING PLANT

No.	Description	Dimensions (feet)	Roof Cover (sq. ft.)
1.	Car unloading building	150 x 60	9,000
2.	Primary storage	[redacted]	
3.	Conveyor		
4.	Screening building	70 x 55	3,850
5.	Primary crusher	525 x 110	57,750
6.	Secondary crusher	525 x 95	49,875
7.	Fine grinding mill	1600 x 170	272,000
8.	Flotation building	1600 x 155	248,000
9.	Regrind mill	475 x 130	61,750
10.	Power sub-station	85 x 45	3,825
11.	Pipeline to tailings dump, and pipeline probably carrying copper ore concentrate to the copper smelter.		
12.	Pipeline carrying nickel ore concentrate to the nickel smelter.		

25X1

TOP SECRET [redacted] 25X1

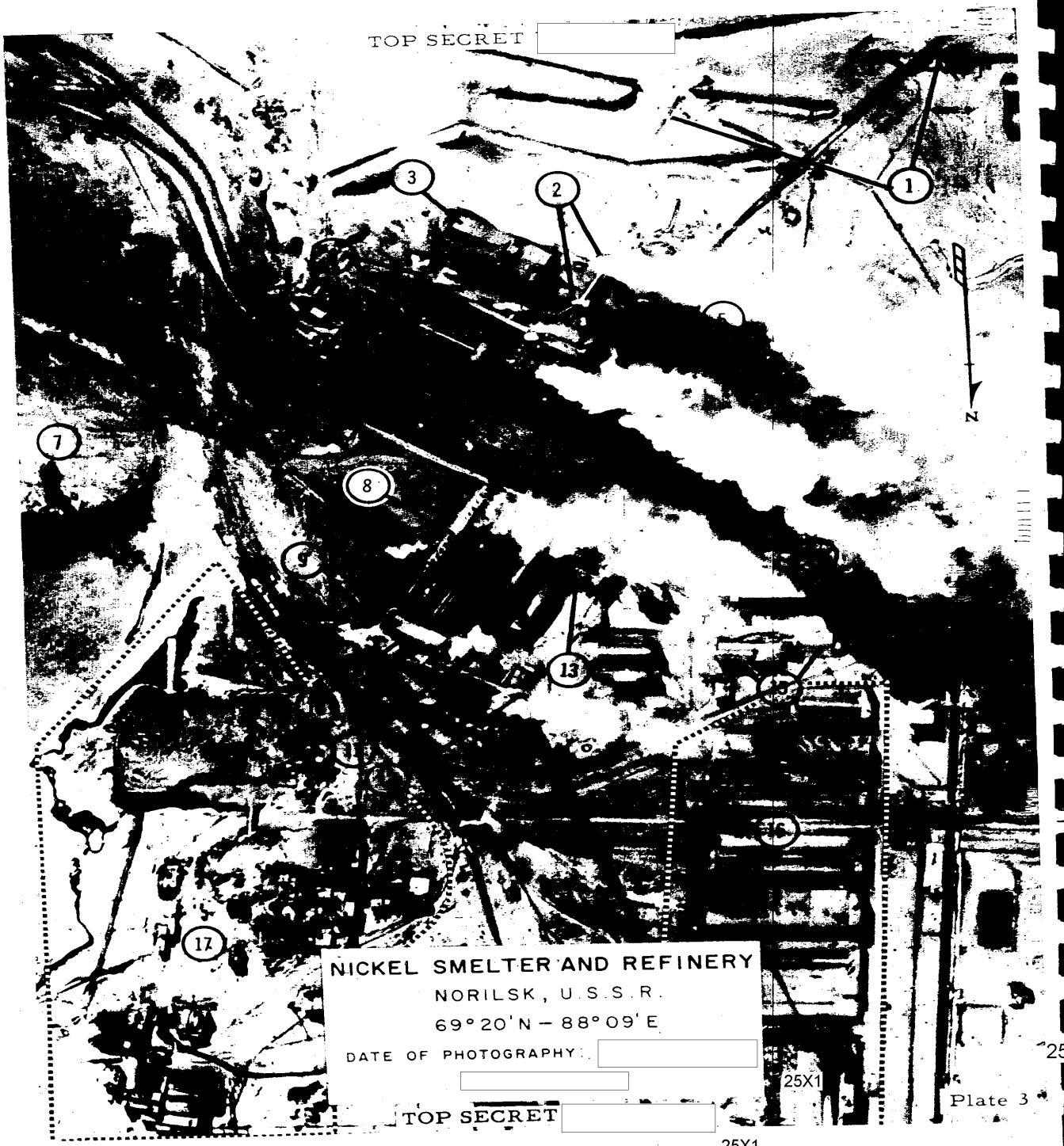
25X1

25X1

25X1

25X1

TOP SECRET



NICKEL SMELTER AND REFINERY
NORILSK, U.S.S.R.
69° 20' N – 88° 09' E
DATE OF PHOTOGRAPHY:

25X1

25X1

Plate 3

TOP SECRET

25X1

NTA/SM-1/57

KEY TO ANNOTATIONS
NICKEL SMELTER AND REFINERY

No.	Description	Dimensions (feet)	Roof Cover (sq. ft.)
1.	Pipeline from ore dressing plant and pump station	--	--
2.	Stack with flues and dust collector	(stack 340' high)	
3.	Dewatering and filtering building	360 x 130	46,800
4.	Coke and coal pulverizing, concentrate mixing, and storage buildings	--	--
5.	Sintering plant	250 x 220	55,000
6.	Storage building for the raw materials to be used in the smelter	565 x 155	87,575
7.	Slag dump	--	--
8.	Smelting building. Contains blast furnaces, converters, controlled cooling, crushing, and grinding machines, reverberatory furnaces, and anode furnaces.	420 x 365	153,000
9.	Stack and flue	(stack 440' high)	
10.	Dust collector and processing building	195 x 70	13,650
11.	Cottrell-type treaters	--	--

ITA/SM-1/57

KEY TO ANNOTATIONS
NICKEL SMELTER AND REFINERY
(CONTINUED)

No.	Description	Dimensions (feet)	Roof Cover (sq. ft.)
12.	Stack and flues	(stack 440' high)	
13.	Anode casting building	125 x 80	10,000
14.	Electrolytic refinery	600 x 310	186,000
15.	Storage for casting and refined nickel	210 x 70 55 x 50 130 x 55	24,600

16. Area containing alloy casting furnaces, foundries, machine shops, and equipment repair shops. Also possible iron forging plant and rolling mill.

17. Small ore dressing and smelter plant. Possibly an iron smelter for processing iron ore concentrate obtained from the large flotation building and also iron obtained from the slag of the nickel and copper smelters. Alternatively, it might be a plant for the recovery of precious metals or a pilot plant for the larger smelters.

NOTE: A small portion of the smelter and refinery area west of the sintering plant is obscured by smoke, steam, and shadows.

25X1

TOP SECRET

COPPER SMELTER AND REFINERY

NORILSK, USSR

69° 20' N – 88° 09' E

DATE OF PHOTOGRAPHY

25X1

25X1

TOP SECRET

Plate 4

25X1

HTA/SM-1/57

KEY TO ANNOTATIONS
COPPER SMELTER AND REFINERY

No.	Description	Dimensions (feet)	Roof Cover (sq. ft.)
1.	Storage buildings	250 x 96 250 x 90 155 x 30	49,650
2.	Maintenance and repair shop	230 x 130	29,900
3.	Pipelines	--	--
4.	Railroad siding and station. Five tracks wide and approximately 2,500' long. Two additional spurs lead to a turning Wye and a coaling station.	--	--
5.	Slag dump	--	--
6.	Coal pulverizing plant. Two buildings.	100 x 65 155 x 45	6,500 6,975
7.	Stack	(490' high)	
8.	Smelter		
	a. Reverberatory furnace section. Reportedly contains one furnace with space allocated for another.	225 x 190	42,750
	b. Converter furnace section. Reported to contain three horizontal-type converters. 2/	300 x 200	60,000
	c. Finishing furnaces and casting section. Reportedly contains two finishing furnaces and two rotary-type anode casting machines. 2/	240 x 200	48,000

KEY TO ANNOTATIONS
COPPER SMELTER AND REFINERY
(CONTINUED)

No.	Description	Dimensions (feet)	Roof Area (sq. ft.)
9.	Office building	300 x 70	24,000
10.	Copper anode storage building. Connected to electrolysis building by underground railroad. 3/	310 x 70	21,700
11.	Electrolysis building. Reportedly contains 4 blocks of 10 tanks each. Each tank is approximately 15' long, 3' wide, and holds 52 electrolytic cells. 3/	450 x 350	157,500
12.	Transformer and control room.	100 x 20	2,000
13.	Ore concentrate and flux preparation building. Reportedly contains four mixing tanks approximately 60' long, 9' wide, and 6' deep. 3/	500 x 350	185,000
14.	Stack	(490' high)	
15.	Water tower	(135' high)	
16.	Probable ore concentrate drying building	200 x 110	27,500
17.	Probable ore concentrate filter or thickener building	110 x 100	11,000
18.	Rail spur servicing smelter and refinery		

PLANT 26. Reported platinum refinery. Plant area enclosed by a fence with six guard towers and guard shack at gate. Main structure, L-shaped, has total roof area of 113,000 sq. ft. Two other buildings, 190' x 45' and 160' x 55'. Precious metals are precipitated in the copper anodes during the electrolytic process. These metals, which settle to the bottom of the electrolytic tanks, are removed and reportedly sent to Plant 26 for further refining. 3/

25X1

25X1

HTA/SM-1/57

KEY TO ANNOTATIONS
COBALT SMELTER AND REFINERY

No.	Description	Dimensions (feet)	Roof Cover (sq. ft.)
1.	Possible crusher building with 120' conveyor. Storage-type building adjacent.	90 x 65 100 x 35	5,850 3,500
2.	Slag pile		
3.	Smelter building, L-shaped, with 220' stack. By-product concentrates high in cobalt content from the nickel and copper smelters and possibly cobalt materials from the ore dressing plant, are brought to this building by rail.	340 x 155 100 x 65	59,200
4.	Unidentified building. Possibly a transformer station.	110 x 55	6,050
5.	Cooling towers.		
6.	L-shaped smelter and refinery building with 2 wings. This building probably contains reveratory and electric furnaces, converters, roasting ovens, flotation and sintering machines, and possibly electrolytic cells.	440 x 135 145 x 120 165 x 120 90 x 75	103,350
7.	Refinery and/or smelter building, L-shaped. This building also has various furnaces, ovens, and possibly electrolytic cells and it appears that smelting and refining that have not been completed in previous phases are completed in this building.	210 x 55 105 x 75	25,425
	Two adjacent storage buildings.	85 x 55 65 x 30	4,925

TOP SECRET

25X1

CIA INTERNAL USE ONLY

HTA/SM-1/57

KEY TO ANNOTATIONS
COBALT SMELTER AND REFINERY
(CONTINUED)

No.	Description	Dimensions (feet)	Roof over (sq. ft.)
8.	Guard towers. There are approximately 8 of these towers around the plant area in addition to a gatehouse on the road entering the plant. The plant appears to be completely surrounded by a fence.		
9.	Steam pipelines.		
10.	Unidentified building, one story.	165 x 55	9,075
11.	Four storage-type buildings in this area	165 x 20 105 x 30 55 x 30 45 x 20	9,000
12.	Ditch for carrying waste liquids from plant.		
13.	Probable gas pipeline from coke plant.		
14.	Unidentified building, one and two stories. 1 story 2 story	 90 x 45 50 x 30	 4,050 1,500
15.	Possible concentrator building. Adjoining this building are 3 or 4 tanks for the storage of acids, bases, and oils, and a stock pile of what appears to be limestone.	200 x 185	37,000
16.	Railroad spurs within plant complex.		
17.	Road entering plant		

TOP SECRET

25X1